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Monograph of the genus *Medionidus* (Bivalvia: Unionidae) mostly from the Apalachicolan Region, Southeastern United States.

By RICHARD I. JOHNSON

Abstract. This paper attempts to elucidate the synonymy of the six species of *Medionidus* (Bivalvia: Unionidae), to reconstruct what was until recently their known distribution, and to discuss their zoogeography.

INTRODUCTION

Medionidus is a genus of Unionidae, or fresh water mussels, consisting of six species. It appears to have originated on, or at least survived on, the Cumberland Plateau. The restricted distribution of *M. conradicus* (Lea) (Pl. 17, black dots) which is confined to the Tennessee and Cumberland River systems, and its abundance, led Ortmann (1925: 354) to regard this species as most characteristic of the Cumberlandian fauna which consists mostly of species not found beyond these river systems. The few Cumberlandian species which also occur in rivers in the Ozark mountains, suggest that this fauna may be a relect from the Cretaceous. *M. conradicus* spread into the Apalachicolan region by an ancient former connection between the Tennessee and Mobile-Alabama-Coosa River systems, where it evolved into *M. acutissimus* (Lea) (Pl. 17, open circles). It is not clear if *M. mcglameriae* van der Schalie (Pl. 17, black star), found in the Tombigbee River drainage of the same river system, is derived from *conradicus* or *acutissimus*, since it is known only from two small specimens. Unlike *conradi-*

cus or *mcglameriae,* which are not sculptured on the posterior slope, *M. penicillatus* (Lea) (Pl. 17, black squares) found in the Yellow, Econfina and Apalachicola River systems; *M. simpsonianus* Walker (Pl. 17 open squares) endemic to the Ocholockonee River system; and *M. walkeri* (B. H. Wright) (Pl. 17, black triangles) similarly restricted to the Suwannee River system, like *acutissimus,* are all sculptured on the posterior slope. These Apalachicolan species appear to be independently derived from *M. acutissimus.*

Historical Considerations

The genus *Medionidus* was proposed by Simpson (1900a: 77), who also published a synonymy of the species (1900b: 588-591). He later (1914: 246-253) modified the synonymy and added descriptions of the species. Simpson (1914: 248,251) recognized *M. parvulus* (Lea) and *acutissimus* (Lea), both from the Mobile-Alabama-Coosa River system, as valid, as did Ortmann (1923: 59; 1924: 99). Van der Schalie (1938: 14), with more extensive collections at his disposal, noted that they intergrated. Later, van der Schalie (1940: 199) followed Simpson (1914: 248, 250) and recognized both *M. penicillatus* (Lea) and *kingi* (B. H. Wright) as valid species occurring in the Apalachicola River system. Clench and Turner (1956: 189) correctly synomymized these forms, but also included in their synonymy, *M. simpsonianus* Walker endemic to the Ochlockonee River system, and *walkeri* (B. H. Wright) endemic to the Suwannee River system. Johnson (1970: 270), in a compilation of the Unionacea of the Apalachicolan Region, followed van der Schalie and recognized both *penicillatus* and *kingi.* Actually, Frierson (1927: 92) had previously published the correct synonymy of the then known species of *Medionidus.* Haas (1969: 413-415) in his compilation of the Unionacea, followed Frierson, merely adding *M. mcglameriae* van der Schalie (1939) which had been subsequently described. Burch (1973: 21) in his identification manual of the North American Unionacea recognized only four of the six species

of *Medionidus*: *conradicus* (Lea), *acutissimus, mcglameriae,* and *penicillatus*. Hurd (1974: 98-99) recognized *conradicus* as occurring in both the Tennessee and the Mobile-Alabama-Coosa River systems, as well as *acutissimus* and *parvulus* in the latter. Burch (1975: 20) in a revised edition of his manual, also recognized *parvulus*. Stansbery (1976: 48) listed *conradicus* as "endangered" in both the "Tennessee and Mobile basins."

Acknowledgements

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Systematic Section

The following abbreviations have been used in the text and on the plate captions.

CM — Carnegie Museum, Pittsburgh, Pennsylvania
MCZ — Museum of Comparative Zoology, Cambridge, Massachusetts
MZUM — Museum of Zoology, University of Michigan, Ann Arbor, Michigan
USNM — National Museum of Natural History, Washington, D.C.

Synonymy. For ease of reference, full citations are included for each taxon, including the type locality and the location

of the type when known. No plate or figure references are included with Lea's Obs. Unio, since they are always the same as in the preceding entry. Elsewhere in the text references are abbreviated.

Descriptions. The measurements are only intended to convey the general size of specimens from a given station, and to indicate sexual differences.

Anatomy. The available data are cited.

Remarks. These are designed to elucidate the differences between the species, and include comments on distribution and taxonomy.

Range. The distribution is summarized.

Abundance. These data are based on the literature and on the number and size of the lots found in the several collections studied.

Habitat. Included when known.

Specimens examined. The majority of the records are based on the collections in the museums mentioned above. Unless otherwise noted, the records are based on specimens in the Museum of Comparative Zoology. The few records which could not be seen are credited to the responsible author.

Aside from the Tennessee and Cumberland river systems, all the other relevant river systems flow into the Gulf of Mexico and are listed from west to east, the assumed direction of major dispersal. The records from each river system are arranged from headwaters to the mouth.

The cumbersome term, Mobile-Alabama-Coosa River system, is used because it reflects the main channel of the river, which was given a different name at each important confluence.

Figures. When available, the holotype, or lectotype, is used to illustrate each species and nominal taxon. When required several illustrations are included to show ecophenotypic variation. Some of the data on the plate captions, such as the measurements, are sometimes not repeated elsewhere.

It is suggested that anyone not familiar with the genera of North American Unionidae consult the key in one of the editions of Burch (1973, 1975).

Family Unionidae (Fleming 1828) Ortmann 1911
Subfamily Lampsilinae (Ihering 1901) Ortmann 1910
Genus Medionidus Simpson 1900

Medionidus Simpson 1900, Proc. Acad. Nat. Sci. Phila. *52:* 77. Type species, *Unio conradicus* Lea, original designation. Simpson, 1900, Proc. U.S. Natl. Mus. *22:* 588; Ortmann, 1912, Ann. Carnegie Mus. *8:* 334; Simpson, 1914, Cat. Naiades *1:* 245; Ortmann, 1915, Nautilus *28:* 143.

Simpson (1914: 246) noted that *Medionidus* "is closely related to *Lampsilis,* but the embryos are contained in irregular, though distinctly marked, ovisacs near the center of the outer gills instead of in regular ovisacs at the hinder part of the gills. The marsupial swelling of the female shell is less developed than in *Lampsilis* and is placed farther forward than in that genus. The male shell is generally somewhat arcuate and the species generally have a well-developed posterior ridge, characters not often found in *Lampsilis.*" Ortmann (1915: 143) confirmed the validity of the genus.

Medionidus conradicus (Lea)

Plate 18, figs. 1-2

Unio plateolus Rafinesque 1831, Cont. Monog. Bivalve Shells River Ohio, p. 3 (Falls of the Cumberland River [Whitley Co., Kentucky], type lost). Ortmann and Walker (1922, Occ. Papers, Mus. Zool., Univ. Michigan, no. 112, p. 58) convincingly argued that this taxon is unidentifiable.

Unio conradicus Lea 1834, Trans. Amer. Philos. Soc. *5:* 63, pl. 9, fig. 23 (no locality [Caney Fork of the Cumberland River, Tennessee]; figured holotype USNM 84134); Lea, 1834, Obs. Unio, *1:* 175.

Medionidus conradicus (Lea), Wilson and Clark, 1914, U.S. Bur. Fisheries, Doc. no. 781, p. 51. Ortmann, 1923, Nautilus *37:* 58, *Ibid.* 1924, 99; 1924, Amer. Midland Nat. *9:* 30, 1925, 353.

Medionidus plateolus (Rafinesque). Ortmann, 1918, Proc. Amer. Philos. Soc. *57:* 575.

Description. Shell small, seldom exceeding 55 mm in length. Outline long elliptical, usually arcuate, especially when fully adult. Valves inequilateral, subinflated, subsolid. Anterior end regularly rounded, posterior end with a rounded point near the base. Ventral margin straight, or more frequently, incurved. Dorsal margin long and slightly curved, forming an indistinct angle with the obliquely

descending posterior margin. Hinge ligament rather long. Posterior ridge broadly rounded. Posterior slope more or less wrinkled. Sometimes somewhat depressed at the center of the disk. Umbos slightly inflated and little elevated, sculptured with fine, irregular corrugations, which tend to be double looped, located at the anterior quarter of the shell. Surface of the shell rather smooth, except for growth ridges. Periostracum scarcely shining, tawny to yellowish green, with feeble, wavy, dark green rays of uneven width which occasionally break into blotches, especially on the posterior slope.

Left valve with two low, stumpy, pseudocardinal teeth and two curved lateral ones. Right valve with one pseudocardinal and one lateral. Anterior adductor muscle scars deep, posterior ones shallow. Pallial line impressed anteriorly, where the shell is thicker. Umbonal cavities slightly excavated, Nacre bluish to dirty white, sometimes iridescent posteriorly.

The male shell is generally arcuate and wider behind. The female shell is generally a little produced along the middle of the base, and this area is sometimes faintly radially groved.

Length mm	Height mm	Width mm	
55	25	14	Clinch River, 5. 5 mi. below Fort Blackmore. Scott Co., Virginia. Male.
48	25	15	Stones River, Murfreesboro, Rutherford Co., Tennessee. Female.
47	23	18	Caney Fork of the Cumberland River, Tennessee. Holotype. Female.

Anatomy. The anatomy was discussed and figured by Ortmann (1912, 335, fig. 22; 1915: 142; 1921:90). Lea (1863: 410 [46]), under *conradicus,* previously discussed the anatomy, but his specimen was from the Etowah River, a tributary of the Mobile-Alabama-Coosa River system, where this species does not occur. Glochidia rather large, subovate, or almost subspatulate. Length 0.22; height 0.28 mm (Ortmann, 1912, pl. 20, fig. 3).

Remarks. Medionidus conradicus (Lea) may be distin-

guished from the other members of the genus by its lack of a posterior ridge, the fineness or virtual absence of corrugations on the posterior slope, the generally arcuate ventral margin, and by the fine rays, which are not reticulated or spotted, but are generally continuous and straight, though the finer ones are sometimes wavy.

The restricted distribution of this species and its abundance led Ortmann (1925:354) to regard it as most characteristic of the Cumberlandian fauna which consists mostly of those species not found beyond the Tennessee and Cumberland River systems.

Hurd (1974: 98) included *conradicus* in the unionid fauna of the Coosa River drainage, based on his identification of lots 605.2-5, and on the former identification of alcoholic lots nos. 14, 24, 66 [the latter were not located] in the Alabama Museum of Natural History; as well as lots 51034, 51055, 69044, 98410, and 98457 in the Museum of Zoology, University of Michigan. Only two of these lots are *conradicus*, one is actually from the Tennessee River system, and the other, merely labeled, "Coosa River, Alabama, Showalter coll'n" is regarded as spurious. It was impossible to personally examine the several lots of specimens in the Alabama Museum where the Showalter collection is located, but it is assumed they are not authentic records from the Mobile-Alabama-Coosa River system.

Range: Restricted to the Tennessee River system in Virginia, Tennessee and Alabama, and the Cumberland River system in Kentucky and Tennessee, including the intervening Duck River drainage of the former.

Abundance. M. conradicus was a common species in the upper and lower Tennessee and Cumberland River systems before impoundments. It distinctly preferred small streams and headwaters, where it is still found (Stansbery and Clench, 1974). Known in the Tennessee River proper from a single specimen in the Carnegie Museum from Muscle Shoals, Alabama, collected by H. H. Smith.

Neel and Allen (1964: 444) reported that *conradicus* was abundant just below the Falls of the Cumberland River in September 1948. They did not find it elsewhere in the

main river, but it was abundant in Beaver Creek and the Rockcastle River, where it extended far up into Laurel Fork.

Habitat: Lives mostly in small streams.

Specimens Examined

TENNESSEE RIVER SYSTEM

Powell River Drainage. *Virginia*: South Fork Powell River, 2 mi. above Big Stone Gap, Wise Co. Powell River above Dryden; 2.5 mi. S. Jonesville; Flannery Ford, 7 mi. SW Jonesville; Walden Creek; Indian Creek, 4 mi. SW Ewing; *all* Lee Co.

Clinch River Drainage. *Virginia*: Clinch River, Cedar Bluff, Tazewell Co. Clinch River, Honaker; Cleveland; Boody; *all* Russell Co. Clinch River, St. Paul, Wise Co. Clinch River, Dungannon; Fort Blackmore; Clinchport; Wayland; Speers Ferry bridge; Moccasin Creek, Weber City; *all* Scott Co. Clinch River, 1.5 mi. S Dona; West Black Water Creek, Black Water; *both* Lee Co. *Tennessee*: Clinch River, Kyles Ford; Sneedsville; "The Rounds"; *all* Hancock Co. Clinch River, 4 mi. NW Thorn Hill, Grainger Co.

Holston River Drainage. *Virginia:* North Fork Holston River, 1.7 mi. SW Ceres, Bland Co. (Stansbery and Clench). Lick Creek, 3 mi. E Chatham Hill; North Fork Holston River, 9 mi. ENE Saltville; 8.5 mi. N Marion; *all* Smyth Co. Wolf Creek, 2 mi NW Lindell; North Fork Holston River, [town of] Holston; Mendota (MZUM); *all* Washington Co. North Fork Holston River, nr. Gate City (MZUM); Big Moccasin Creek, 2.75 mi. SE Gate City; *both* Scott Co. Middle Fork, Holston River, 3. 75 mi. S Glade Spring; South Fork Holston River, 1.25 mi. SE Lodi; *both* Washington Co. *Tennessee:* South Fork Holston River, Bluff City; Kingsport; (*both* MZUM) *both* Sullivan Co. Big Creek, Rogersville, Hawkins Co.

French Broad River Drainage. *North Carolina*: French Broad River, Ashville, Buncombe Co. (CM). Little Pigeon River, Sevierville, Sevier Co.

Little River Drainage. *Tennessee:* Little River, 1.5 mi. below Walland, Blount Co. (MZUM).

Little Tennessee River Drainage. *Tennessee:* Tellico Creek, 1.5 mi. above Little Tennessee River, Monroe Co.

Hiwassee River Drainage. *Tennessee:* Conasauga Creek, Monroe Co. (MZUM 98457).

Chickamauga Creek Drainage. *Georgia:* South Chickamauga Creek (CM).

Paint Rock River Drainage. *Alabama*: Estill Fork Paint Rock River, Estillfork; Paint Rock River, [town of] Paint Rock (CM); *both* Jackson Co.

Flint River Drainage. *Alabama:* Flint River, Gurley, Madison Co. (MZUM).

Elk River Drainage. *Tennessee:* Elk River, Estill Springs; Rock Creek, 2 mi. W Estill Springs (MZUM); Boiling Fork Creek, 1 mi. E Winchester; *all* Franklin Co.

Blue Water Creek Drainage. *Alabama:* Blue Water Creek, Lauderdale Co. (CM).

Shoals Creek Drainage. *Alabama:* Shoals Creek, Bailey Springs, Lauderdale Co.

Tennessee River Drainage. Alabama: Tennessee River, Muscle Shoals, Colbert and Lauderdale Cos. (CM).

Duck River Drainage. *Tennessee:* Duck River, Normandy (CM); Garison Creek, Wartrace (CM); Duck River, Shelbyville; *all* Bedford Co. Duck River, Wilhoite (MZUM); Hardinsons Mill, 12 mi. NW Lewisburg; Clay Hill; *all* Marshall Co. Duck River, Columbia, Maury Co.

CUMBERLAND RIVER SYSTEM

Rockcastle River Drainage. *Kentucky:* Laurel Fork, McGee, Jackson Co. (MZUM). Rockcastle River, Livingston; Cedarville; *both* Rockcastle Co.

Cumberland River Drainage. *Kentucky:* Cumberland River, just below Cumberland Falls, Whitley Co. Cumberland River, Smith Shoals, 3 mi. E Burnside, Pulaski Co.

South Fork Drainage. *Kentucky:* Little South Fork River, 3. 8 mi. E Coopersville, Wayne Co. South Fork, 2 mi. above Burnside, Pulaski Co. (MZUM).

Beaver Creek Drainage. *Kentucky:* Beaver Creek [Wayne Co.] (Neel and Allen).

Obey River Drainage. *Tennessee:* [Obey River] Pickett Co.

Roaring River Drainage. *Tennessee:* Roaring River [Jack-

son and Overton Cos.] (Wilson and Clark).

Caney Fork Drainage. *Tennessee:* Collins River, Shells Ford, Warren Co. Caney Fork.

Stones River Drainage. *Tennessee:* West Fork Stones River, 8.3 mi NW Murfreesboro; Stones River, Murfreesboro; *both* Rutherford Co. Stones River 1.25 mi. W Couchville, Davidson Co.

Red River Drainage. *Kentucky:* Red River [town of] Red River, Logan Co. (MZUM).

Medionidus acutissimus (Lea)

Plate 18, figs. 3-8

Unio acutissimus Lea 1831, Trans. Amer. Philos. Soc. *4*: 89, pl. 10, fig. 18 (Alabama River, type lost, 3 specimens subsequently identified by Lea, MCZ 178887); Lea, 1834, Obs. Unio *1*: 99

Unio rubellinus Lea 1857, Proc. Acad. Nat. Sci. Phila. *9*: 32 (Othcalooga [Oothkalooga] Creek, Gordon Co., Georgia). Lea, 1858, Jour. Acad. Nat. Sci. Phila. (2) *4*: 70, pl. 13, fig. 51; figured holotype USNM 84136. Lea, 1858, Obs. Unio *6*:70.

Unio parvulus Lea 1860, Proc. Acad. Nat. Sci. Phila. 12: 307 (Coosa River, Alabama; Chattanooga [Chattooga River] Georgia). Lea, 1866, Jour. Acad. Nat. Sci. Phila. (2) *6*: 45, pl. 16, fig. 43, figured holotype USNM 84139 from the latter locality. Lea, 1867, Obs. Unio *11*: 49.

Unio semiplicatus Küster 1862, Conchylien-Cabinet (2) 9, pt. 2 *Unio*, p. 279, pl. 94, fig. 4 (Neu-Holland [Australia, error], location of type not known).

Description: Shell small, seldom exceeding 55 mm in length. Outline elongated rhomboidal. Valves inequilateral, inflated, subsolid. Anterior end regularly rounded, posterior end somewhat to acutely pointed. Ventral margin slightly curved or incurved, dorsal margin rather long and slightly curved, forming an indistinct angle with the obliquely descending posterior margin. Hinge ligament rather long. Posterior ridge low and rounded to rather high and sharp, sometimes slightly double. Posterior slope, and sometimes the greater part of the shell, corrugatedly plicate. Umbos slightly inflated and little elevated, their sculpture not observed, located at the anterior quarter of the shell. Surface of the shell quite smooth except where plicated. Periostracum generally shining, yellowish or greenish, marked with fine green rays which are generally broken or zigzag.

Left valve with two low, stumpy, pseudocardinal teeth

and two curved lateral ones. Right valve with one pseudocardinal and one lateral. Anterior adductor muscle scars deep, posterior ones shallow. Pallial line impressed anteriorly, where the shell is thicker. Umbonal cavities slightly excavated. Nacre bluish-green, salmon, flesh color or white.

The male shell is generally arcuate, with the posterior end drawn to a rather sharp point at the posterior base. The female shell is somewhat swollen in the middle of the base, and the posterior point is a little above the base.

Length mm	Height mm	Width mm	
34	18	11	Chattooga River, Chattooga Co., Georgia. Male.
47	20	16	As above. Female.

Anatomy. The anatomy was discussed by Lea (see under the synonymy of: *rubellinus* 1858; *acutissimus* 1863: 411 [47]; and *parvulus* 1866). Ortmann (under *parvulus,* 1923: 59) said that the anatomy of the females he studied was practically identical with that of *M. conradicus* (Lea). He further noted that the glochidia were subspatulate like those of *conradicus* and that they corresponded to the minimum measurements known in the latter. Length 0.19; height 0.25.

Remarks. Medionidus acutissimus (Lea) is closest to *conradicus* (Lea), but differs from the latter in that it usually has a much more pointed posterior end, a sharper posterior ridge, and a posterior slope with coarse corrugations. The color rays are reticulated, interrupted or spotted, whereas those of *conradicus* are continuous.

M. acutissimus (Lea) of the Mobile-Alabama-Coosa River system is obviously derived from *conradicus* (Lea) of the Tennessee and Cumberland river systems. The presence of *Medionidus* in the Mobile-Alabama-Coosa river system affords evidence of a former connection between it and the Tennessee River system (van der Schalie, 1938: 27).

Ortmann (1923: 59, 60) distinguished between *acutissimus* and *parvulus* primarily on the basis that the former had a pointed posterior end and a sharp posterior ridge, whereas the latter was not pointed, and had a rounded posterior ridge, with a less plicate posterior slope. Van der

Schalie (1938: 14), with superior collections of the forms at his disposal, noted that they integrated. The most sharply pointed and plicated specimens are usually immature, which strongly suggests that these adaptations are useful in preventing dislocation from the substrate.

Three of the lots listed by Hurd (1974:98) under *conradicus* from the Mobile-Alabama-Coosa River system are actually *acutissimus* and are included here, under: Specimens Examined, with their catalogue numbers, the only data given by Hurd.

Range. Restricted to the Mobile-Alabama-Coosa River system in Tennessee, Georgia, Alabama, and Mississippi.

Abundance. M. acutissimus is a common species in the headwater streams in Tennessee and Georgia, where it is sometimes locally abundant; elsewhere it appears scarce. Formerly it was abundant in the Cahaba River, Lily Shoals, Bibb County, Alabama. Hurd (1974: 170–180), during an extensive survey of the Coosa River for Unionidae, collected at 194 stations, but he (1974: 42, 99) found a total of only 22 specimens of *acutissimus* from 4 localities.

Habitat. Lives mostly in small streams.

Specimens Examined

MOBILE-ALABAMA-COOSA RIVER SYSTEM

Conasauga River Drainage. *Tennessee:* Conasauga River. [town of] Conasauga, Polk Co. (MCZ and MZUM 51055). Coahulla Creek, 7.2 mi. SSE Cleveland, Bradley Co. *Georgia:* Conasauga River, Beaverdale; Swamp Creek; *both* Whitfield Co. Conasauga River, Gregorys Mill, 10 mi. N Eton; Upper Kings Bridge; Lower Kings Bridge; Campbells Mill; *all* Murray Co. Conasauga River, Fikes Ford, 1.4 mi. N Resaca, Gordon Co.

Oothkalooga Creek Drainage. *Georgia:* Oothkalooga Creek, 3.7 mi. SE Calhoun, Gordon Co.

Etowah River Drainage. *Georgia:* Etowah River [Bartow Co.] (Lea).

Chattooga River Drainage. *Georgia:* Duck Creek; Chattooga River, Martindale, (MZUM); *both* Walker Co. Arum-

chee Creek, Floyd Co. Chattooga River, Trion (CM); Summerville (MCZ and MZUM 51034, 69044); Lyerly (MZUM); Telloga Creek; *all* Chattooga Co.

Coosa River Drainage. *Alabama:* Mill Creek; Coosa River, Cedar Bluff (MZUM); *both* Cherokee Co. Big Canoe Creek, 9.5 mi. NE Ashville; Coosa River, Minnesota Bend (MZUM); *both* St. Clair Co. Choccolocco Creek, nr. Jackson Shoals (CM); Coosa River, Jackson Shoals (MZUM); Talladega Creek; *all* Talladega Co. Coosa River, Weduska Shoals, Shelby Co. (MZUM). Coosa River, Jumbo, Chilton Co. (MZUM).

Cahaba River Drainage. *Alabama:* Cahaba River, Henryellen, Jefferson Co. (MZUM). Shoal Creek, Montevallo; Cahaba River, Gurnee (MZUM); *both* Shelby Co. Cahaba River. Lily Shoals, Bibb Co. Cahaba River, 5 mi. NE Marion, Perry Co. (MZUM); Cahaba River, 10 mi. W Selma, Dallas Co.

Black Warrior River Drainage. *Alabama:* Locust Fork, 3.75 mi. WNW Selfville, Blount Co. Village Creek [nr. Burmingham]; Black Warrior River; *both* Jefferson Co. Black Warrior River, Lock 15, Rose Shoals, Tuscaloosa Co. (MZUM). Black Warrior River, Erie, Greene Co. (Conrad, 1838: 87).

Tombigbee River Drainage. *Alabama:* Sipsey River, Texas, Marion Co. (CM). Sipsey River, Elrod; Tynes; (*both* MZUM) *both* Tuscaloosa Co. *Mississippi:* Tombigbee River, Columbus (MCZ and MZUM); Floating Creek, Columbus (Hinkley); *both* Lowndes Co.

Medionidus penicillatus (Lea)

Plate 18, figs. 9, 10; Plate 19, figs. 1, 2

Unio penicillatus Lea 1857, Proc. Acad. Nat. Sci. Phila. *9:* 171 (Chattahoochee River, near Columbus [Muscogee Co.]; [Chattahoochee River] near Atlanta [De Kalb Co]; Flint River, near Albany [Dougherty Co.]; *all* Georgia). Lea, 1859, Jour. Acad. Nat. Sci. Phila. (2) *4:* 203, pl. 23, fig. 85, figured holotype USNM 84142 from the third locality. Lea, 1859, Obs. Unio *7:* 21. Clench and Turner (1956: 190), not have seen the type, mistakenly restricted the type locality to the first one mentioned.

Unio kingii B. H. Wright 1900, Nautilus *13;* 138 (a branch of the Flint River, Baker Co., Georgia; measured holotype USNM 159965, figured by Johnson 1967, Occ. Pap. on Moll., *3:* 7, pl. 5. fig. 6)

Description. Shell small, seldom exceeding 55 mm in length. Outline elongated rhomboidal to long elliptical. Valves inequilateral, subinflated, subsolid. Anterior end regularly rounded, posterior end with a rounded point near the base. Ventral margin straight or gently curved, sometimes slightly arcuate near the posterior end, dorsal margin slightly curved, merging imperceptably with the obliquely descending posterior margin. Hinge ligament rather long. Posterior ridge rounded to bluntly angled. Posterior slope usually strongly corrugated. Umbos slightly inflated and little elevated, their sculpture consisting of double looped ridges, located at the anterior quarter of the shell. Surface of the shell quite smooth except where plicated. Periostracum generally shining, yellowish or greenish, marked with fine green rays which are often broken, giving a mottled appearance.

Left valve with two low, stumpy pseudocardinal teeth and two curved lateral ones. Right value with one pseudocardinal and one lateral. Anterior adductor muscle scars deep, posterior ones very shallow. Pallial line impressed anteriorly. Umbonal cavities slightly elevated. Nacre purplish or greenish, often lurid and spotted, posteriorly iridescent.

The male shell generally has a straight ventral margin which may be slightly arcuate posteriorly. The female shell is generally smaller than that of the male, is more fully developed ventrally, and the posterior point is more elevated above the base than is that of the male.

Length mm	Height mm	Width mm	
52	27	20	Flint River, Bainbridge, Decatur Co., Georgia. Male.
44	23	17	As above. Female.

Anatomy. The anatomy was discussed by Lea (see under the synonymy of: *penicillatus* 1859) and the glochidum figured (1858: 47, pl. 5, fig. 5). The glochidia are subspatulate.

Remarks. Medionidus penicillatus (Lea) most closely resembles *acutissimus* (Lea) of the Mobile-Alabama-Coosa River system, from which it is undoubtedly derived. It differs

from the latter, in that the shell is higher, less arcuate, and has a lower posterior ridge with a posterior slope that is generally more finely and strongly corrugated.

Van der Schalie (1940: 199, pl. 3, figs. 5, 6) figured a female shell as *penicillatus* and a male as *kingi*, recognizing both taxa as valid, however there is much integration of the forms, the acuteness of the posterior ridge and the amount of sculpture on the posterior ridge being variable.

Range. Yellow River System in Alabama; Econfina Creek system in Florida; and the Apalachicola River system in Florida, Georgia, and Alabama.

Abundance. The number of specimens in the collections studied indicate that this species is relatively abundant in the Apalachicola River system, especially the Flint River drainage, and is scarce elsewhere.

Habitat: Lives in sand and gravel in streams where there is moderate current. (Clench and Turner 1956: 191).

Specimens Examined

YELLOW RIVER SYSTEM

Yellow River Drainage. *Alabama:* Yellow River, 7 mi. NW Lockhart, Covington Co. (MZUM, collected by W. H. Heard, Oct. 1963).

ECONFINA CREEK SYSTEM

Econfina Creek Drainage. *Florida:* Econfina Creek 7 mi. W Youngstown, Bay Co.

APALACHICOLA RIVER SYSTEM

Chipola River Drainage. *Alabama:* Big Creek, nr. Taylor, Houston Co. (MZUM). *Florida:* Big Creek, 8 mi. W Malone; Spring Creek, nr. Alabama state line (MZUM); *both* Jackson Co. *Alabama:* Cowarts Creek, nr. Cowarts; Reedy Creek, nr. Madrid (MZUM); *both* Houston Co. *Florida:* Reedy Creek, 6 mi. W Malone; Chipola River, 1 mi. N Mariana; Spring Creek, 2.5 mi. SE Mariana (MZUM); Rocky Creek, 2.4 mi. NNW Sink Creek; *all* Jackson Co. Chipola River, 2.5 mi. SE Chason; 2 mi. E Clarksville; Dead Lake of Chipola River, 20 mi. S. Blountstown; *all* Cahoun Co.

Chattahoochee River Drainage. *Georgia* [Chattahoochee River], near Atlanta, [De Kalb Co.] (Lea). Mulberry Creek, 3 mi. SSE Mountain Hill, Harris Co. (Clench and Turner). Chattahoochee River, Columbus, Muscogee Co. Sawhatchee Creek, 14 mi NW Donalsonville, Seminole Co.

Apalachicola River Drainage. *Florida:* Apalachicola River, Chattahoochee, Gadsden Co.

Flint River Drainage. *Georgia*: Sandy Mount Creek, 6 mi, N Vienna, Dooly Co. Gum Creek, 2 mi. N Cordele; Cedar Creek, 6 mi. SW Cordele; *both* Crisp Co. Jones Creek, 2 mi. S Oakfield; Abrams Creek, 5 mi. S Oakfield (MZUM); Mill Creek, 8 mi. S Oakfield; *all* Worth Co. Branch of Flint River; Flint River; *both* Baker Co. Flint River, Albany, Dougherty Co. Ichawaynochaway Creek, Calhoun Co. (MZUM). Flint River, Bainbridge; Recovery; *both* Decatur Co.

Medionidus walkeri (B. H. Wright)

Plate 19, figs. 3, 4

Unio walkeri B. H. Wright 1897, Nautilus *11*: 91 (Suwannee River, [Ellaville], Madison Co., Florida. Lectotype USNM 150506 selected by Johnson, 1969, Occ. Pap. on Moll. *3*: 9, pl. 8, fig. 1).

Description. Shell rather small, seldom exceeding 50 mm in length. Outline subrhomboid to ovate, but short. Valves inequilateral, rather inflated and solid. Anterior end regularly rounded, posterior end with a rounded point near the base. Ventral margin straight, dorsal margin forming a perceptable angle with the obliquely descending posterior margin. Hinge ligament short. Posterior ridge high and angled. Posterior slope with strong, curved, radiating corrugations. Occasional corrugations on the disk. Umbos full and high, their sculpture not observed, located at the anterior third of the shell. Surface of the shell often with strong irregular growth lines. Periostracum usually black or yellowish green; usually without rays, though sometimes with broad, very faint, greenish ones.

Left valve with two somewhat compressed pseudocardinal teeth, and two short lateral ones. Right valve with one pseudocardinal and one lateral. Anterior adductor muscle

scars deep, posterior ones shallow. Pallial line distinct anteriorly. Umbonal cavities slightly excavated, with dorsal muscle scars under the hinge plate behind the pseudocardinal teeth. Nacre bluish white or pinkish.

The male shell is decidedly rhomboid, straight on the base, bluntly pointed at the posterior base, and obliquely subtruncate on the posterior slope. The female shell is smaller and longer than that of the male, is swollen just behind the central base, and the posterior point is raised above the base line.

Length mm	Height mm	Width mm	
44	26	16	Suwannee River, Ellaville, Madison Co. Florida. Male
40	22	14	As above. Female

Anatomy. Not known.

Remarks. Medionidus walkeri (B. H. Wright) is quite distinct from the other members of *Medionidus.* Male shells are more rhomboidal with a sharper posterior ridge with coarser plications than any other species. Although females tend to resemble *penicillatus,* the dark, generally rayless, periostracum distinguishes both sexes from any other *Medionidus.*

Range. Endemic to the Suwannee River system in Florida.

Abundance. Appears to be abundant at the type locality, but elsewhere known from small numbers of specimens.

Habitat. Found in sand and mud in slow, clear water.

Specimens Examined

SUWANNEE RIVER SYSTEM

Withlacoochee River Drainage. *Florida*: Withlacoochee River, Blue Spring, Madison Co.

Suwannee River Drainage. *Florida*: Suwannee River, Ellaville, Madison Co. Suwannee River, Bradford, Suwannee Co. Suwannee River, Oldtown, Dixie Co. (Clench and Turner). Suwannee River, Fannin Springs, Gilchrist Co.

Santa Fe River Drainage. *Florida*: Santa Fe River, Worthington Springs, Union Co.

Medionidus simpsonianus Walker

Plate 19, figs. 5-8

Medionidus simpsonianus Walker 1905, Nautilus *18:* 136, pl. 9, figs. 4, 5 ([Ochlockonee River], Calvary [Grady Co.], Georgia; holotype MZUM 98501).

Description. Shell small, seldom exceeding 55 mm in length. Outline elliptical. Valves inequilateral, rather inflated, subsolid. Anterior end regularly rounded and compressed, posterior end obtusely rounded, the tip being nearly on the medial line of the shell. Ventral margin distinctly and regularly curved. Dorsal margin slightly curved, merging imperceptibly with the posterior margin. Hinge ligament short. Posterior ridge somewhat angled. Posterior slope covered with strong, sub-concentric, somewhat irregular ridges, extending from the posterior ridge to the posterior margin. Sometimes with faint sculpture below the posterior ridge. Umbos rather low, their sculpture not observed, located at the anterior third of the shell. Surface of the shell smooth and usually polished. Periostracum dark yellow, yellowish green, or brownish, covered with dark green pencilled rays which tend to break into a distinctive network of angular lines covering the entire surface.

Left valve with two crenulate, compressed, pseudocardinal teeth, which are nearly in line and two delicate, straight, lateral ones. Right valve with one pseudocardinal and one lateral. Anterior adductor muscle scars deep, posterior ones very shallow. Pallial line usually visible. Umbonal cavities but slightly excavated with dorsal muscle scars under the hinge plate behind the pseudocardial teeth. Nacre bluish-white.

Sexual differences slight, the female shell is less elongate than that of the male.

Length mm	Height mm	Width mm	
44	21	15	Ochlockonee River, 7 mi. S Cairo, Grady Co. Georgia. Male.
42	24	15	As above. Female.

Remarks. Medionidus simpsonianus Walker differs from all other *Medionidus* in that the anterior end tends to be

more compressed, the anterior margin more elevated, and the ventral margin is consistently and regularly rounded. The shell is equally curved above and below, the point being nearly on the medial line and not near the basal margin, as it is in all other *Medionidus*, giving *simpsonianus* a unique outline. When the rays are broken they break into angles which form patterns unlike those of any other of the species.

Range. Endemic to the Ochlockonee River system in Georgia and Florida.

Abundance. Long known only from the holotype and two paratypes, it was collected in some numbers from a single locality in 1934 and again from several localities in 1954.

Habitat. Lives in sand and gravel in streams where there is moderate current.

Specimens Examined

OCHLOCKONEE RIVER SYSTEM

Ochlockonee River Drainage. *Georgia*: Ochlockonee River, 7 mi. S Cairo; between Reno and Beachton; Calvary (MZUM): *all* Grady Co. *Florida*: Ochlockonee River, 11 mi. NW Tallahassee; 8 mi. W Talahassee; *both* Leon Co. Ochlockonee River, Wakulla Co. Little River, 3.5 mi. E Quincy, Gadsen Co.

Medionidus mcglameriae van der Schalie

Plate 19, fig. 9

Medionidus mcglameriae van der Schalie 1939, Occ. Pap., Mus. Zool., Univ. Michigan, no. 407: 1-2, pl. 1, figs. 1-3 (Tombigbee River, Epes, Sumter Co., Alabama; holotype MZUM 130460).

Description. Shell very small not known to exceed 2.35 mm in length, "thin, oval in outline, somewhat swollen posteriorly. Posterior ridge low and well rounded, with a more or less prominent wing above the ridge. Beaks placed within anterior third of shell, but slightly raised above the hinge line. Beak sculpture not apparent because of erosion of the umbonal region. Anterior end of shell well rounded and somewhat cut away basally, giving the alate

shell a wedge-shaped appearance laterally; posterior end broadly biangulate. Viewed from above the shell has a characteristic wedge shape with the greatest diameter at about the center of the posterior ridge. The outline of the shell when viewed thus tends to be somewhat twisted. The epidermis has a yellow-green background crossed by numerous fine, undulating often blotched, green rays, which are somewhat concentrated along the posterior half of the shell. Outer surface uneven, slightly reticulate, and crossed by prominent growth rests. Left valve with two inconspicuous, stumpy pseudocardinal teeth (the one just anterior to the umbone most prominent), and two rather remote, lamellar, curved laterals. Right valve with one blunt, prominent pseudocardinal and one prominent lateral, occasionally with a small spurious one above it. Nacre bluish white, thin, with relatively deep anterior muscle scars and the posterior scars evident but shallow." (van der Schalie)

Length mm	Height mm	Width mm	
2.35	1.2	0.75	Tombigbee River, Epes, Sumter Co., Alabama. Holotype.
2.10	1.0	0.50	As above. Paratype.

Remarks. *Medionidus mcglameriae* van der Schalie differs from all other *Medionidus* in that the shell is distinctly alate, and is wedge shaped both laterally and dorsally. It is also distinguishable by its small size, the the thinness of the shell, and the delicacy of the teeth.

It is assumed that this species evolved from *M. conradicus* or *acutissimus*, though it resembles neither very much.

Range. Endemic to the Tombigbee River drainage of the Mobile-Alabama-Coosa River system in Alabama.

Abundance. Known only from the holotype and a paratype in the Alabama Museum of Natural History.

Habitat. Found on a small sand bar in shallow water.

Specimen Examined

MOBILE-ALABAMA-COOSA RIVER SYSTEM

Tombigbee River Drainage. Alabama: Tombigbee River, Epes, Sumter Co. (MZUM).

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Plate 17
Distribution of the Genus *Medionidus*

Black dots. Distribution of *Medionidus conradicus* (Lea). Tennessee and Cumberland River systems, including the intervening Duck River drainage of the former.

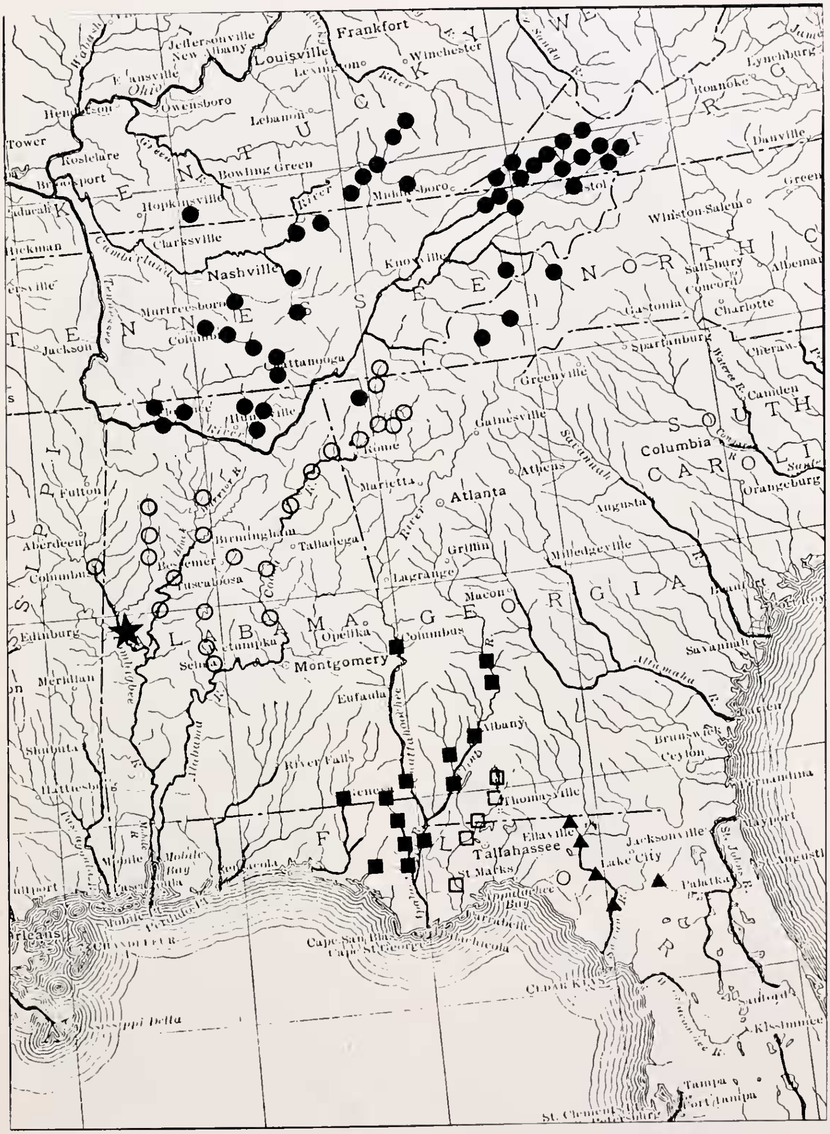
Open circles. Distribution of *Medionidus acutissimus* (Lea) Mobile-Alabama-Coosa River system.

Black star. Distribution of *Medionidus mcglameriae* van der Schalie. Known only from the Tombigbee River drainage of the Mobile-Alabama-Coosa River system at Epes, Sumter Co. Alabama.

Black squares. Distribution of *Medionidus penicillatus* (Lea). Yellow River system, Econfina Creek system, and the Apalachicola River system.

Open squares. Distribution of *Medionidus simpsonianus* Walker. Ochlockonee River system.

Black Triangles. Distribution of *Medionidus walkeri* (B. H. Wright). Suwannee River system.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Middlesboro
Lynchburg
Roanoke
Danville
Winston-Salem
Clarksville
Nashville
Knoxville
Murfreesboro
Jackson
Chattanooga
Salisbury
Concord
Gastonia
Charlotte
Spartanburg
Greenville
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Talladega
Griffin
Milledgeville
Lagrange
Tuscaloosa
Macon
Opelika
Columbus
Montgomery
Savannah
Meridian
Eufaula
Albany
Brunswick
River Falls
Thomasville
Ellaville
Jacksonville
Tallahassee
Lake City
St. Marks
Palatka
Tampa
Fort Tampa
Atlanta
Nashville
Montgomery
Columbia

Plate 17

Plate 18

Medionidus conradicus (Lea)

Fig. 1. Virginia. Specimen identified by Lea, MCZ 178931. Length 45 mm, height 20 mm, width 12 mm. Male.

Fig. 2. *Unio conradicus* Lea. [Caney Fork of the Cumberland River, Tennessee]. Holotype USNM 84134. Length 47 mm, height 23 mm, width 18 mm. Female.

Medionidus acutissimus (Lea)

Fig. 3. *Unio acutissimus* Lea. Alabama River. Type lost. Figure from Lea. Length 28 mm, height 12 mm, width 9 mm. Male.

Fig. 4. Alabama. Specimen identified by Lea, MCZ 178887. Length 22 mm, height 10 mm, width 7 mm. Female.

Fig. 5. *Unio rubellinus* Lea. Oothkalooga Creek, Gordon Co. Georgia. Holotype USNM 84136. Length 38 mm, height 19 mm, width 15 mm. Male.

Fig. 6. Conasauga River, Campbells Mill, Murray Co. Georgia. MCZ 64057. Length 47 mm, height 21 mm, width 14 mm. Female.

Fig. 7. *Unio parvulus* Lea. Chattooga River, Gordon Co. Georgia. Holotype USNM 84139. Length 41.5 mm, height 18 mm, width 11 mm. Male.

Fig. 8. *Unio semiplicatus* Küster. [Alabama River system]. Location of type know known. Figure from Küster. Length 24 mm, height 11 mm, width 9 mm. Female.

Medionidus penicillatus (Lea)

Fig. 9. *Unio penicillatus* Lea. Flint River, near Albany, Dougherty Co., Georgia. Holotype USNM 84142. Length 33.5 mm, height 18, width 12.5 mm. Male.

Fig. 10. *Unio kingii* B. H. Wright. A branch of the Flint River, Baker Co., Georgia. Holotype USNM 159965. Length 37, height 20, width 15 mm. Female.

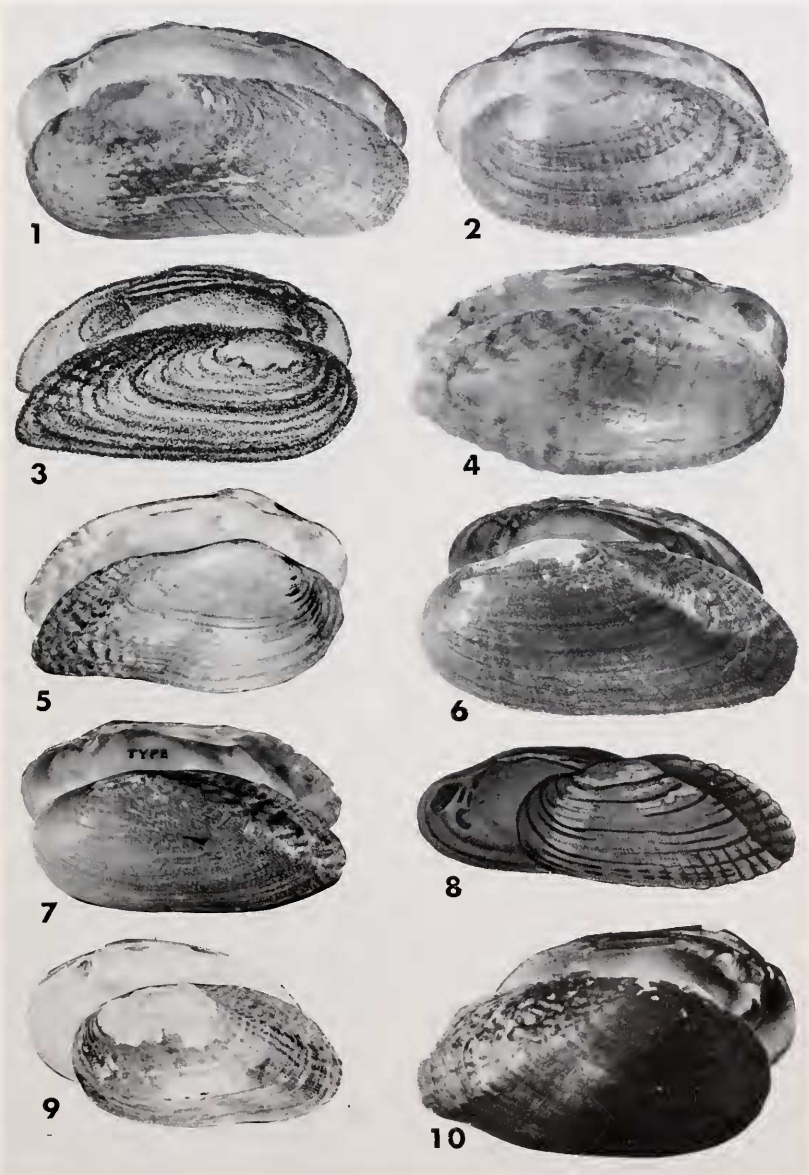

Plate 18

Plate 19

Medionidus penicillatus (Lea)

Fig. 1. *Unio kingii* B. H. Wright. A branch of the Flint River, Baker Co., Georgia. Paratype MCZ 30045. Length 41, height 21, width 15 mm. Male.

Fig. 2. *Unio kingii* B. H. Wright. A branch of the Flint River, Baker Co., Georgia. Paratype MCZ 20156. Length 34 mm, height 20 mm, width 14 mm. Female.

Medionidus walkeri (B. H. Wright)

Fig. 3. *Unio walkeri* B. H. Wright. Suwannee River [Ellaville], Madison Co., Florida. Lectotype USNM 150506. Length 47, height 25 mm, width 17 mm. Male.

Fig. 4. Suwannee River, Ellaville, Madison Co., Florida. MCZ 30049. Length 45 mm, height 22 mm, width 16 mm. Female.

Medionidus simpsonianus Walker

Fig. 5. *Medionidus simpsonianus* Walker. [Ochlockonee River], Calvary, [Grady Co.], Georgia. Holotype MZUM 98501. Length 36 mm, height 19 mm, width 13 mm. Male.

Fig. 6. Ochlockonee River, 7 mi. S Cairo, Grady Co., Georgia. MCZ 190298. Length 42 mm, height 24 mm, width 16. Female.

Fig. 7. Ochlockonee River, 7 mi. S Cairo, Grady Co., Georgia. MCZ 190298. Length 45 mm, height 23 mm, width 17 mm. Male.

Fig. 8. Little River, 3.5 mi. E Quincy, Gadsden Co., Florida. MCZ 190301. Length 33.5 mm, height 19 mm, width 13 mm. Female.

Medionidus mcglameriae van der Schalie

Fig. 9. *Medionidus mcglameriae* van der Schalie. Tombigbee River, Epes, Sumter Co., Alabama. Holotype MZUM 130460. Length 2.35 mm, height 1.2 mm, width 0.75 mm.

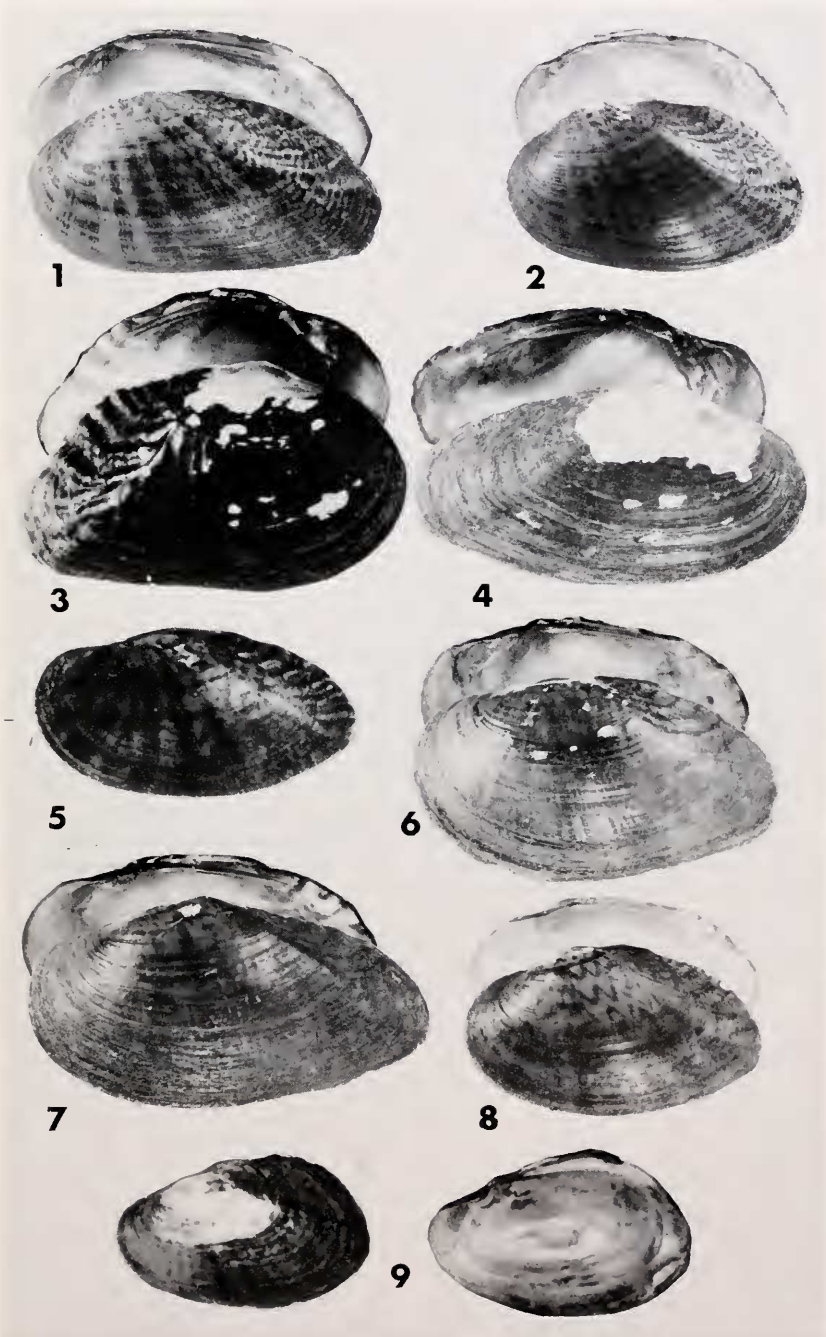

Plate 19